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Serial No. 09/579,736

PD990025

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Patent Application

Inventors : **Christian Buchler et al.**
Serial No. : **09/579,736**
Filed : **May 26, 2000**
Title : **APPARATUS FOR SCANNING OPTICAL RECORDING
MEDIA USING A DIFFERENTIAL PHASE DETECTION
METHOD**
Examiner : **Aristotelis M. Psitos**
Art Unit : **2653**

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Patricia A. Verlangieri

APPELLANTS' BRIEF UNDER 37 C. F. R. § 1.192

On July 29, 2004, Appellants filed a timely Notice of Appeal (that was received in the United States Patent and Trademark Office on July 29, 2004) from the action of the Examiner finally rejecting pending claims 1-17. The Appellants herein file this Brief in accordance with 37 C. F. R. § 1.192.

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1. IDENTIFICATION OF REAL PARTY IN INTEREST

The real party in interest for the above-identified application is Thomson Inc., which is the assignee of the assignee of record for this application, Deutsche Thomson-Brandt GmbH.

2. IDENTIFICATION OF RELATED APPEALS OR INTERFERENCES

To the best of appellants' knowledge, there are no appeals or interferences that will be directly affected by, or will have a bearing on the decision of this appeal.

3. STATUS OF THE CLAIMS

The above-identified application was filed on May 26, 2000 claiming priority under 35 U. S. C. § 119 to German Patent Application No. 199 24 733.1 filed May 31 1999. Claims 1-17 were pending. In a Preliminary Amendment filed on May 26, 2000 claims 1-17 were amended.

A first Office Action was mailed September 10, 2003 (Paper No. 7), in which claims 1-17 were rejected.

In appellants' response to the first Office Action, dated March 10, 2004, claims 1, 8, 14 and 17 were amended.

The Examiner in a second Office Action was mailed April 29, 2004 (Paper No. 9), finally rejected claims 1-17.

The status of the claims is as follows:

Twice amended claims 1, 8, 14 and 17. Once amended claims 2-7, 9-13 and 15-16. All claims stand finally rejected.

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4. STATUS OF THE AMENDMENTS

No amendments were made to the claims after final rejection. All amendments were entered.

5. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 1 is directed to an apparatus for reading from or writing to optical recording media. See appellant's specification at page 1, lines 7-11. The apparatus includes a photodetector 10, a phase forming unit 13, an edge sequence detector 14 and a signal blocking unit 15. See appellant's specification at FIG. 1 and page 8, line 6 to page 9, line 16. The photodetector 10 includes at least two detector elements 10A, 10B, 10C, 10D. See appellant's specification at FIG. 1 and page 8, lines 23-32. The phase forming unit 13 detects a phase difference between output signals of the photodetector 10. See appellant's specification at page 9, lines 2-4. The edge sequence detector 14 detects a sequence of edges of the output signals of the photodetector. See appellant's specification at page 9, lines 4-8. The signal blocking unit 15, in response to the edge sequence detector 14, blocks output signals of the phase forming unit 13, when an impermissible sequence of edges is detected. See appellant's specification at page 9, lines 8-16.

Independent claim 10 is directed to a method for determining a correct track error signal using a phase detection method. See appellant's specification at page 1, lines 7-11. The method includes checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence. See appellant's specification at page 9, lines 6-10. Thereafter, the outputting of a phase value is prevented when the impermissible sequence is detected. See appellants' specification at page 9, lines 10-16.

Dependent claim 11 is directed to a method for determining a correct track error signal using a phase detection method. See appellant's specification at

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page 1, lines 7-11. The method includes checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence. See appellant's specification at page 9, lines 6-10. Thereafter, the outputting of a phase value is prevented when the impermissible sequence is detected. See appellants' specification at page 9, lines 10-16. The impermissible sequence is a sequence of more than two successive zero crossings of one of the signals without the occurrence of a zero crossing in another of the signals. See appellant's specification at page 4, lines 29-33.

Dependent claim 12 is directed to a method for determining a correct track error signal using a phase detection method. See appellant's specification at page 1, lines 7-11. The method includes checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence. See appellant's specification at page 9, lines 6-10. Thereafter, the outputting of a phase value is prevented when the impermissible sequence is detected. See appellants' specification at page 9, lines 10-16. The impermissible sequence is a sequence of more than one pair of zero crossings within a predetermined time period, a pair of zero crossings consisting of a zero crossing of one of the signals and a succeeding zero crossing of another one of the signals. See appellant's specification at page 5, lines 9-16.

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

1. The Examiner has rejected claims 1-10, 13 and 17 as anticipated under 35 U. S. C. § 102(a) by Shiyuuichi (JP 10-198981).
2. The Examiner has rejected claims 1-3, 6, 9, 10 and 17 as anticipated under 35 U. S. C. § 102(e) by Kuribayashi (U. S. 6,317,396).
3. The Examiner has rejected claims 11-12 as being unpatentable under 35 U. S. C. § 103(a) over Shiyuuichi (JP 10-198981) in view of Kuribayashi (U. S. 6,317,396).

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4. The Examiner has rejected claims 11-12 as being unpatentable under 35 U. S. C. § 103(a) over Kuribayashi (U. S. 6,317,396) in view of Koji (JP 10-208262).

7. ARGUMENT

1. Rejection of claims 1-10, 13 and 17 under 35 U. S. C. § 102(a) over Shiyuuichi (JP 10-198981).

Claims 1-9

Shiyuuichi discloses a tracking signal detector. See Shiyuuichi in Abstract, Problem to be Solved, lines 1-3. The time sequence of a single signal is checked for 3T and 4T signals. See Shiyuuichi in Abstract, Solution, lines 1-7. The tracking signal is annulled when 3T and 4T signals with low signal-to-noise ratios are detected. See Shiyuuichi in Abstract, Solution, lines 7-10.

In appellant's claims 1-9, an apparatus is described for reading from or writing to optical recording media. See appellant's specification at page 1, lines 7-11. The apparatus includes a photodetector 10, a phase forming unit 13, an edge sequence detector 14 and a signal blocking unit 15. See appellant's specification at FIG. 1 and page 8, line 6 to page 9, line 16. The photodetector 10 includes at least two detector elements 10A, 10B, 10C, 10D. See appellant's specification at FIG. 1 and page 8, lines 23-32. The phase forming unit 13 detects a phase difference between output signals of the photodetector 10. See appellant's specification at page 9, lines 2-4. The edge sequence detector 14 detects a sequence of edges of the output signals of the photodetector. See appellant's specification at page 9, lines 4-8. The signal blocking unit 15, in response to the edge sequence detector 14, blocks output signals of the phase forming unit 13, when an impermissible sequence of edges is detected. See appellant's specification at page 9, lines 8-16.

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Shiyuichi does not describe or suggest an apparatus for reading from or writing to optical recording media including a photodetector having at least two detector elements, a phase forming unit for detecting a phase difference between output signals of the photodetector, an edge sequence detector for detecting a sequence of edges of the output signals of the photodetector and a signal blocking unit that, in response to the edge sequence detector, blocks output signals of the phase forming unit when an impermissible sequence of edges is detected. Rather, Shiyuichi only teaches checking the timing sequence of a single signal for 3T and 4T signals and annulling the tracking signal when 3T and 4T signals with low signal-to-noise ratios are detected. Therefore, appellant's submit that claims 1-9 are not anticipated by Shiyuichi.

Claims 10, 13 and 17

Appellant's claims 10, 13 and 17 disclose a method for determining a correct track error signal using a phase detection method. See appellant's specification at page 1, lines 7-11. The method includes checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence. See appellant's specification at page 9, lines 6-10. Thereafter, the outputting of a phase value is prevented when the impermissible sequence is detected. See appellants' specification at page 9, lines 10-16.

Shiyuichi does not describe or suggest a method for determining a correct track error signal using a phase detection method including the steps of checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence and preventing the outputting of a phase value when the impermissible sequence is detected. Rather, Shiyuichi only teaches checking the timing sequence of a single signal for 3T and 4T signals and annulling the tracking signal when 3T and 4T signals with low signal-to-noise ratios are detected. Therefore, appellant's submit that claims 10, 13 and 17 are not anticipated by Shiyuichi.

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2. Rejection of claims 1-3, 6, 9, 10 and 17 under 35 U. S. C. § 102(a) over Kuribayashi (U. S. 6,317,396).

Claims 1-3, 6 and 9

Kuribayashi discloses a tracking error generating device. See Kuribayashi at column 1, lines 5-8. In the tracking error generating device, evaluation target signals processed from light receiving element output signals are individually checked for amplitude or line width. See Kuribayashi at column 2, lines 48-67.

In appellant's claims 1-3, 6 and 9, an apparatus is described for reading from or writing to optical recording media. See appellant's specification at page 1, lines 7-11. The apparatus includes a photodetector 10, a phase forming unit 13, an edge sequence detector 14 and a signal blocking unit 15. See appellant's specification at FIG. 1 and page 8, line 6 to page 9, line 16. The photodetector 10 includes at least two detector elements 10A, 10B, 10C, 10D. See appellant's specification at FIG. 1 and page 8, lines 23-32. The phase forming unit 13 detects a phase difference between output signals of the photodetector 10. See appellant's specification at page 9, lines 2-4. The edge sequence detector 14 detects a sequence of edges of the output signals of the photodetector. See appellant's specification at page 9, lines 4-8. The signal blocking unit 15, in response to the edge sequence detector 14, blocks output signals of the phase forming unit 13, when an impermissible sequence of edges is detected. See appellant's specification at page 9, lines 8-16.

Kuribayashi does not describe or suggest an apparatus for reading from or writing to optical recording media including a photodetector having at least two detector elements, a phase forming unit for detecting a phase difference between output signals of the photodetector, an edge sequence detector for detecting a sequence of edges of the output signals of the photodetector and a signal blocking unit that, in response to the edge sequence detector, blocks output signals of the phase forming unit when an impermissible sequence of edges is

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detected. Rather, Kuribayashi teaches a completely different arrangement in which tracking error signals are detected based on evaluation target signals processed from light receiving element output signals that are individually checked for amplitude or line width. Therefore, appellant's submit that claims 1-3, 6 and 9 are not anticipated by Kuribayashi.

Claims 10 and 17

Appellant's claims 10 and 17 disclose a method for determining a correct track error signal using a phase detection method. See appellant's specification at page 1, lines 7-11. The method includes checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence. See appellant's specification at page 9, lines 6-10. Thereafter, the outputting of a phase value is prevented when the impermissible sequence is detected. See appellants' specification at page 9, lines 10-16.

Kuribayashi does not describe or suggest a method for determining a correct track error signal using a phase detection method including the steps of checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence and preventing the outputting of a phase value when the impermissible sequence is detected. Rather, Kuribayashi teaches a completely different method in which tracking error signals are detected based on evaluation target signals processed from light receiving element output signals that are individually checked for amplitude or line width. Therefore, appellant's submit that claims 10 and 17 are not anticipated by Kuribayashi.

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3. Rejection of claims 11-12 under 35 U. S. C. § 103(a) over Shiyuuichi (JP 10-198981) in view of Kuribayashi (U. S. 6,317,396).

Claim 11

Shiyuuichi discloses a tracking signal detector. See Shiyuuichi in Abstract, Problem to be Solved, lines 1-3. The time sequence of a single signal is checked for 3T and 4T signals. See Shiyuuichi in Abstract, Solution, lines 1-7. The tracking signal is annulled when 3T and 4T signals with low signal-to-noise ratios are detected. See Shiyuuichi in Abstract, Solution, lines 7-10.

In appellant's claim 11, a method is disclosed for determining a correct track error signal using a phase detection method. See appellant's specification at page 1, lines 7-11. The method includes checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence. See appellant's specification at page 9, lines 6-10. Thereafter, the outputting of a phase value is prevented when the impermissible sequence is detected. See appellants' specification at page 9, lines 10-16. The impermissible sequence is a sequence of more than two successive zero crossings of one of the signals without the occurrence of a zero crossing in another of the signals. See appellant's specification at page 4, lines 29-33.

Shiyuuichi does not describe or suggest a method for determining a correct track error signal using a phase detection method including the steps of checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence and preventing the outputting of a phase value when the impermissible sequence is detected, where the impermissible sequence is a sequence of more than two successive zero crossings of one of the signals without the occurrence of a zero crossing in another of the signals. Rather, Shiyuuichi only teaches checking the timing sequence of a single signal for 3T and 4T signals and annulling the tracking signal when 3T and 4T signals with low

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signal-to-noise ratios are detected. Therefore, appellant's submit that claim 11 patentable over Shiyuuichi.

Kuribayashi discloses a tracking error generating device. See Kuribayashi at column 1, lines 5-8. In the tracking error generating device, evaluation target signals processed from light receiving element output signals are individually checked for amplitude or line width. See Kuribayashi at column 2, lines 48-67.

Kuribayashi does not describe or suggest a method for determining a correct track error signal using a phase detection method including the steps of checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence and preventing the outputting of a phase value when the impermissible sequence is detected, where the impermissible sequence is a sequence of more than two successive zero crossings of one of the signals without the occurrence of a zero crossing in another of the signals. Rather, Kuribayashi teaches a completely different method in which tracking error signals are detected based on evaluation target signals processed from light receiving element output signals that are individually checked for amplitude or line width. Therefore, appellant's submit that claim 11 patentable over Kuribayashi.

Further, since Shiyuuichi only teaches checking the timing sequence of a single signal for 3T and 4T signals and annulling the tracking signal when 3T and 4T signals with low signal-to-noise ratios are detected and Kuribayashi only teaches detecting tracking error signals based on evaluation target signals processed from light receiving element output signals that are individually checked for amplitude or line width, the combination of these references does not describe or suggest applicant's arrangement recited in claim 11. In particular, claim 11 recites a method for determining a correct track error signal using a phase detection method including the steps of checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence and preventing the outputting of a phase value when the impermissible sequence is detected, where the impermissible sequence is a sequence of more than two successive zero crossings of one of the signals without the occurrence of a zero

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crossing in another of the signals. Thus, claim 11 is not obvious over Shiyuuichi in view of Kuribayashi.

Claim 12

In appellant's claim 12, a method is disclosed for determining a correct track error signal using a phase detection method. See appellant's specification at page 1, lines 7-11. The method includes checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence. See appellant's specification at page 9, lines 6-10. Thereafter, the outputting of a phase value is prevented when the impermissible sequence is detected. See appellants' specification at page 9, lines 10-16. The Impermissible sequence is a sequence of more than one pair of zero crossings within a predetermined time period, a pair of zero crossings consisting of a zero crossing of one of the signals and a succeeding zero crossing of another one of the signals. See appellant's specification at page 5, lines 9-16.

Shiyuuichi does not describe or suggest a method for determining a correct track error signal using a phase detection method including the steps of checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence and preventing the outputting of a phase value when the impermissible sequence is detected, where the impermissible sequence is a sequence of more than one pair of zero crossings within a predetermined time period, a pair of zero crossings consisting of a zero crossing of one of the signals and a succeeding zero crossing of another one of the signals. Rather, Shiyuuichi only teaches checking the timing sequence of a single signal for 3T and 4T signals and annulling the tracking signal when 3T and 4T signals with low signal-to-noise ratios are detected. Therefore, appellant's submit that claim 12 patentable over Shiyuuichi.

Kuribayashi does not describe or suggest a method for determining a correct track error signal using a phase detection method including the steps of

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checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence and preventing the outputting of a phase value when the impermissible sequence is detected, where the impermissible sequence is a sequence of more than one pair of zero crossings within a predetermined time period, a pair of zero crossings consisting of a zero crossing of one of the signals and a succeeding zero crossing of another one of the signals. Rather, Kuribayashi teaches a completely different method in which tracking error signals are detected based on evaluation target signals processed from light receiving element output signals that are individually checked for amplitude or line width. Therefore, appellant's submit that claim 12 patentable over Kuribayashi.

Further, since Shiyuichi only teaches checking the timing sequence of a single signal for 3T and 4T signals and annulling the tracking signal when 3T and 4T signals with low signal-to-noise ratios are detected and Kuribayashi only teaches detecting tracking error signals based on evaluation target signals processed from light receiving element output signals that are individually checked for amplitude or line width, the combination of these references does not describe or suggest applicant's arrangement recited in claim 12. In particular, claim 12 recites a method for determining a correct track error signal using a phase detection method including the steps of checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence and preventing the outputting of a phase value when the impermissible sequence is detected, where the impermissible sequence is a sequence of more than one pair of zero crossings within a predetermined time period, a pair of zero crossings consisting of a zero crossing of one of the signals and a succeeding zero crossing of another one of the signals. Thus, claim 12 is not obvious over Shiyuichi in view of Kuribayashi.

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4. Rejection of claims 11-12 under 35 U. S. C. § 103(a) over Kuribayashi (U. S. 6,317,396) in view of Koji (JP 10-208262).

Claim 11

Kuribayashi discloses a tracking error generating device. See Kuribayashi at column 1, lines 5-8. In the tracking error generating device, evaluation target signals processed from light receiving element output signals are individually checked for amplitude or line width. See Kuribayashi at column 2, lines 48-67.

In appellant's claim 11, a method is disclosed for determining a correct track error signal using a phase detection method. See appellant's specification at page 1, lines 7-11. The method includes checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence. See appellant's specification at page 9, lines 6-10. Thereafter, the outputting of a phase value is prevented when the impermissible sequence is detected. See appellants' specification at page 9, lines 10-16. The impermissible sequence is a sequence of more than two successive zero crossings of one of the signals without the occurrence of a zero crossing in another of the signals. See appellant's specification at page 4, lines 29-33.

Kuribayashi discloses a tracking error generating device. See Kuribayashi at column 1, lines 5-8. In the tracking error generating device, evaluation target signals processed from light receiving element output signals are individually checked for amplitude or line width. See Kuribayashi at column 2, lines 48-67. In appellant's claim 11, a method is disclosed for determining a correct track error signal using a phase detection method. See appellant's specification at page 1, lines 7-11. The method includes checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence. See appellant's specification at page 9, lines 6-10. Thereafter, the outputting of a phase value is prevented when the impermissible sequence is detected. See appellants' specification at page 9, lines 10-16. The impermissible sequence is a sequence

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of more than two successive zero crossings of one of the signals without the occurrence of a zero crossing in another of the signals. See appellant's specification at page 4, lines 29-33.

Kuribayashi does not describe or suggest a method for determining a correct track error signal using a phase detection method including the steps of checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence and preventing the outputting of a phase value when the impermissible sequence is detected, where the impermissible sequence is a sequence of more than two successive zero crossings of one of the signals without the occurrence of a zero crossing in another of the signals. Rather, Kuribayashi teaches a completely different method in which tracking error signals are detected based on evaluation target signals processed from light receiving element output signals that are individually checked for amplitude or line width. Therefore, appellant's submit that claim 11 patentable over Kuribayashi.

Koji describes a tracking signal detector. See Koji in Abstract, Problem to be Solved, line 1. The tracking error signal is detected based on whether a phase difference occurs within a prescribed time. See Koji in Abstract, Solution, lines 1-9.

Koji does not describe or suggest a method for determining a correct track error signal using a phase detection method including the steps of checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence and preventing the outputting of a phase value when the impermissible sequence is detected, where the impermissible sequence is a sequence of more than two successive zero crossings of one of the signals without the occurrence of a zero crossing in another of the signals. Rather, Koji only teaches detecting a tracking error signal based on whether a phase difference occurs within a prescribed time. Therefore, appellant's submit that claim 11 patentable over Koji.

Further, since Kuribayashi only teaches detecting tracking error signals based on evaluation target signals processed from light receiving element output

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signals that are individually checked for amplitude or line width and Koji only teaches detecting a tracking error signal based on whether a phase difference occurs within a prescribed time, the combination of these references does not describe or suggest applicant's arrangement recited in claim 11. In particular, claim 11 recites a method for determining a correct track error signal using a phase detection method including the steps of checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence and preventing the outputting of a phase value when the impermissible sequence is detected, where the impermissible sequence is a sequence of more than two successive zero crossings of one of the signals without the occurrence of a zero crossing in another of the signals. Thus, claim 11 is not obvious over Kuribayashi in view of Koji.

Claim 12

In appellant's claim 12, a method is disclosed for determining a correct track error signal using a phase detection method. See appellant's specification at page 1, lines 7-11. The method includes checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence. See appellant's specification at page 9, lines 6-10. Thereafter, the outputting of a phase value is prevented when the impermissible sequence is detected. See appellants' specification at page 9, lines 10-16. The impermissible sequence is a sequence of more than one pair of zero crossings within a predetermined time period, a pair of zero crossings consisting of a zero crossing of one of the signals and a succeeding zero crossing of another one of the signals. See appellant's specification at page 5, lines 9-16.

Kuribayashi does not describe or suggest a method for determining a correct track error signal using a phase detection method including the steps of checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence and preventing the outputting of a phase value when

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the impermissible sequence is detected, where the impermissible sequence is a sequence of more than one pair of zero crossings within a predetermined time period, a pair of zero crossings consisting of a zero crossing of one of the signals and a succeeding zero crossing of another one of the signals. Rather, Kuribayashi teaches a completely different method in which tracking error signals are detected based on evaluation target signals processed from light receiving element output signals that are individually checked for amplitude or line width. Therefore, appellant's submit that claim 12 patentable over Kuribayashi.

Koji does not describe or suggest a method for determining a correct track error signal using a phase detection method including the steps of checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence and preventing the outputting of a phase value when the impermissible sequence is detected, where the impermissible sequence is a sequence of more than one pair of zero crossings within a predetermined time period, a pair of zero crossings consisting of a zero crossing of one of the signals and a succeeding zero crossing of another one of the signals. Rather, Koji only teaches detecting a tracking error signal based on whether a phase difference occurs within a prescribed time. Therefore, appellant's submit that claim 11 patentable over Koji.

Further, since Kuribayashi only teaches detecting tracking error signals based on evaluation target signals processed from light receiving element output signals that are individually checked for amplitude or line width and Koji only teaches detecting a tracking error signal based on whether a phase difference occurs within a prescribed time, the combination of these references does not describe or suggest applicant's arrangement recited in claim 12. In particular, claim 12 recites a method for determining a correct track error signal using a phase detection method including the steps of checking a sequence of zero crossings whose phases are detected with regard to impermissible sequence and preventing the outputting of a phase value when the impermissible sequence is detected, where the impermissible sequence is a sequence of more than one

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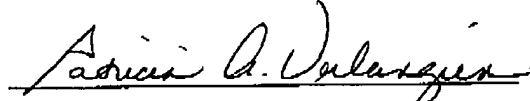
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pair of zero crossings within a predetermined time period, a pair of zero crossings consisting of a zero crossing of one of the signals and a succeeding zero crossing of another one of the signals. Thus, claim 12 is not obvious over Kuribayashi in view of Koji.

8. CONCLUSION

In view of the above, it is respectfully submitted that the rejection of claims 1-17 should be reversed.

Respectfully submitted,



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